

### REMARKS

Applicant respectfully requests reconsideration of the instant application on the basis of newly amended Claims 1, 3, 5, and 7. Claims 1 and 5 are the main claims and the remaining claims are directly or indirectly dependent upon those.

The Examiner has rejected the claims as being unpatentable over U.S. Patent No. 5,118,318 by Wijnen (*Wijnen*). It is believed that Claims 1 to 8 are clearly distinguishable over this reference and also U.S. Patent No. 4,940,528 by Oki *et al.* (*Oki*) cited in the prosecution of the corresponding PCT application for the reasons that will be set forth.

Support for the amendment of Claims 1 and 5 is found in claim 3 as formerly presented.

The *Wijnen* reference describes a storage cathode of a porous sintered body of a refractory metal produced by compacting and sintering powder particles of a refractory metal coated with a thin layer of a ductile metal.

*Oki* teaches an oxygen sensor element that includes an electrode layer "mainly constituted by a platinum group metal in which a refractory material is dispersed."

### Claim Rejections – 35 USC § 112

The Examiner rejected Claims 2-8 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

Applicants authored the electronic submission using PASAT in accordance with the directions of the EPS PASAT manual. Please note that on page 36 of the PASAT manual available at the USPTO web site there is an informational comment that: "When the specification is viewed as an XML instance, the references are rendered as hyperlinks."

Thus Applicants respectfully suggest that the present specification is in accordance with current electronic filing requirements for PASAT authored specification and requests that the Examiner withdraws the objection to the claims 2-8.

The Examiner also rejected Claim 5 as being "vague and indefinite with respect to the phase 'having a desired diameter suitable for forming into a film.'" Applicants believe that currently amended claim 5 addresses this concern. However, if the Examiner continues the rejection arguing that "it is unclear as to what the diameter can be without affecting the functionality and response time of the current collector in generating gas," then Applicants respectfully request that the Examiner introduce evidence into the record to support the position that such is not within the understanding and skill of the ordinary engineer or designer in the field to which the present invention pertains. To the extent that the rejection is based on any personal knowledge of the Examiner, Applicant respectfully requests the Examiner submit an affidavit.

### **35 U.S.C. § 102(b) Grounds for Rejection**

The Examiner has principally rejected the claims 1 and 5 as being anticipated by *Wijnen*. It is believed that Claims 1 to 8 are clearly distinguishable over this reference for the reasons that will be set forth.

Independent Claim 1 recites the following elements, the most pertinent to this discussion being presented in bold type for the convenience of the Examiner:

1. A current collector for an electrochemical device of the type that includes an ionically conductive electrolyte layer for gas generating, the invention comprising:

the current collector layer having a high electrical conductivity and being porous to desired gas generated by the electrochemical device; and,

the current collector layer being substantially formed as a film comprised of a layer of **spherical ceramic refractory material objects having a conductive coating of a precious metal.**

Since such spherical ceramic refractory material objects having a conductive coating of a precious metal of the Applicants' invention as claimed are not disclosed or suggested by *Wijnen*, Applicants suggest that the claimed structure of the present invention is neither identical to or disclosed by the *Wijnen* apparatus. Therefore, *Wijnen* cannot anticipate the present claimed invention.

### **35 U.S.C. § 103 Grounds for Rejection**

Claims 2-8 have been rejected in the corresponding PCT application as being unpatentable over *Wijnen* in view of *Oki*. Applicant respectfully traverses these rejections for the reasons discussed below.

If refractory material were simply dispersed into the ductile metal of the present invention, then there would be a minimum volume percent (assuming spherical particles of both the refractory material and ductile metal phases) of approximately 31 % for the ductile metal that would be required to exceed the percolation threshold limit of the composite in order to provide a continuous ductile metal phase, which would be necessary for electrode structure functionality. The present invention applies to cases using a precious metal for the ductile metal coating, in which situation it is desirable to minimize the total volume percentage of precious metal required

due to its high cost. Also, a functional electrode structure made in accordance with the present invention could consist of significantly less than 31 volume percent precious metal because it is present only as a uniform and thin coating over the refractory particles.

The methods disclosed by *Oki* would require much more of the potentially expensive ductile metal (such as platinum, palladium or gold) compared to the present apparatus and methods for constructing a device with similar performance.

Additionally, *Wijnen* must sinter the body in a reducing atmosphere (hydrogen) (Col. 4 line 66) in order to prevent a phase change in the refractory metal support structure, whereas using the present invention, one may sinter the coating in air and therefore at a lower cost without risk of oxidizing the ceramic support spheres since they are composed of oxide materials.

By this structure Applicants are able to achieve the advantages which have hitherto not been able to be achieved through any adaption of the prior art. It is therefore believed to be clear that the particular structure of Applicants is extremely important and is not a mere matter of design. It should also be noted that the *Wijnen* reference has been available since June 2, 1992 and the *Oki* reference has been available since July 10, 1990. Between that time and the present, no-one except Applicants has constructed current collector for an electrochemical device of the type that includes an ionically conductive electrolyte layer for gas generating without the disadvantages discussed above and which are clearly set forth on the first few pages of Applicant's specification. It is certainly believed to be pertinent that no-one has achieved or anticipated Applicant's structure despite the availability of the reference.

It is improper to use hindsight having read the Applicant's disclosure to "pick and choose" among isolated prior art references to disparage the claimed invention. In re Fine, 837

F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). Even where an invention is, as a whole, fully disclosed by a combination of prior art elements, such elements cannot be combined to defeat a patent as obvious unless the art teaches or suggests the desirability of making the combination. ASC Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 221 U.S.P.Q. 929 (Fed. Cir. 1984). Thus, the mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Fritch, 972 F.2d 1260, U.S.P.Q.2d 1780 (Fed. Cir. 1992). Finally, it is the invention as a whole that is important. Focusing on the obviousness of substitutions and differences, instead of on the invention as a whole, is a legally improper way to simplify the often difficult determination of obviousness. Gillette Co. v. S. C Johnson & Son, Inc., 919 F. 2d 720, 16 U.S.P.Q. 1923 (Fed. Cir. 1990).

Independent Claim 1, as amended, recites the following elements, the most pertinent to this discussion being presented in bold type for the convenience of the Examiner:

the current collector layer being substantially formed as a film  
comprised of a layer of **spherical ceramic refractory material objects**  
**having a conductive coating of a precious metal.**

Applicant respectfully submits that the combination of *Wijnen* with *Oki* does not disclose, teach, or suggest spherical ceramic refractory material objects having a conductive coating of a precious metal as recited by amended Claim 1.

Further, it should be noted that *Oki* teaches the use of a refractory material (metal oxide) being dispersed into a platinum group metal.

Dependent Claims 2-4 and 6-8 that depend from independent Claims 1 or 5 are also not made obvious by *Wijnen* in view of *Oki* because they include the limitations of Claim 1 and add

additional elements that further distinguish the art. Therefore, Applicant respectfully requests that Claims 1-8 be allowed.

#### **Information Disclosure Statement**

Applicants have previously submitted the *Oki* reference on a separately filed Information Disclosure Statement that was filed electronically on November 23, 2004.

#### **Conclusion**

Applicant has now made an earnest attempt to place this case in condition for allowance. In light of the amendments and remarks set forth above, Applicant respectfully requests reconsideration and allowance of Claims 1-8.

If there are matters which can be discussed by telephone to further the prosecution of this Application, Applicant invites the Examiner to call the attorney at the number listed below at the Examiner's convenience.

Respectfully submitted,



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## **ATTACHMENT A**

### **LISTING OF CLAIMS WITH MARKINGS TO SHOW CHANGES MADE**

Attachment A  
Listing with Markings  
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**Claim(s)**

1. (Currently Amended) A current collector for an electrochemical device of the type that includes an ionically conductive electrolyte layer for gas generating, the invention comprising:

the current collector layer having a high electrical conductivity and being porous to desired gas generated by the electrochemical device; and,

the current collector layer being substantially formed as a film comprised of a layer of spherical ceramic refractory material objects having a conductive coating of a precious metal.

2. (Original) The invention of claim 1 wherein the precious metal is selected from the group consisting of silver, palladium, gold, or platinum, or alloys of these metals with other metals.

3. (Currently Amended) The invention of claim 1 wherein the refractory material is a metal oxide ceramic.

4. (Original) The invention of claim 1 wherein the refractory material is selected from the group consisting of zirconia, alumina, ceria, or perovskite.

5. (Currently Amended) A metal coated element for forming a current collector for an electrochemical device of the type that includes an ionically conductive electrolyte layer for gas generating, the invention comprising:

spherical ceramic refractory material objects having a conductive coating of a precious metal; and the coated spherical objects having a desired diameter suitable for forming into a desired film;

whereby the coated spherical objects can be formed into a current conducting film.

6. (Original) The invention of claim 5 wherein the precious metal is selected from the group consisting of silver, palladium, gold, or platinum, or alloys of these metals with other metals.



7. (Currently Amended) The invention of claim 5 wherein the refractory material is a metal oxide ceramic.

8. (Original) The invention of claim 5 wherein the refractory material is selected from the group consisting of zirconia, alumina, ceria, or perovskite.